

Appl. No. 09/833,278

CLAIMS

1-20 (Canceled).

21. (Previously presented) In a method for adhesively joining or sealing two substrates using a polyurethane adhesive composition comprising a polyurethane prepolymer composition and, optionally, an isocyanate-reactive curative by applying onto a substrate the polyurethane adhesive composition and contacting the adhesive composition disposed on the substrate to a second substrate such that a bond is formed, the improvement which comprises utilizing a polyurethane prepolymer composition comprising the prepolymer reaction product of (a) 4,4'-diphenylmethane diisocyanate (MDI) and (b) a polyol composition comprising a propylene oxide based polyether polyol and consisting essentially of at least 80 wt% perfect prepolymers and less than 2 wt% free MDI monomer.

22. (Previously presented) The method of Claim 21 in which the 4,4'-diphenylmethane diisocyanate comprises isomeric mixtures of MDI and/or polymeric MDI.

23. (Previously presented) The method of Claim 21 in which the 4,4'-diphenylmethane diisocyanate comprises an isomeric mixture of MDI containing 30 – 98 wt% of 4,4' isomer, 2 – 70 wt% of the 2,4' isomer, and 0 – 5 wt% of the 2,2' isomer (with the wt% totaling 100%); and/or polymethylene poly(phenylisocyanate) having an average isocyanate functionality of 2.1 to 3.5, isocyanate group content of 18.0 to about 33.6, and containing about 30 to 96 wt% monomeric 4,4' MDI, about 2 – 70 wt% monomeric 2,4' MDI, and less than 5 wt% monomeric 2,2' MDI, and from 2 – 60 wt% higher ring homologues of the MDI series (with the wt% totaling 100%).

24. (Previously presented) The method of Claim 21 in which the propylene oxide based polyether polyol is a polypropylene polyether polyol with functionality of two or greater and an average equivalent weight between 100 and 3000.

25. (Previously presented) The method of Claim 21 in which the propylene oxide based polyether polyol is an ethylene oxide capped polypropylene polyether polyol.

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26. (Previously presented) The method of Claim 21 in which 0 to 60 wt% of the polyol composition comprises a di- or multi-functional alkylene ether polyol, a polyester polyol, a polyester polyol from polycaprolactones or a hydroxyl terminated polybutadienes.

27. (Previously presented) The method of Claim 21 in which the polyurethane prepolymer composition consists essentially of at least 90 wt% perfect prepolymers.

28. (Previously presented) The method of Claim 21 in which the polyurethane prepolymer composition consists essentially of less than 1 wt% free MDI monomer.

29. (Previously presented) The method of Claim 21 in which the polyurethane prepolymer composition comprises a free prepolymer NCO functionality ranging from 0.2 to 15 wt%.

30. (Previously presented) The method of Claim 21 in which the polyurethane polyol composition has an average Mn ranging from about 400 to 16,000.

31. (Previously presented) In a method for adhesively joining or sealing two substrates using a polyurethane adhesive composition comprising a polyurethane prepolymer composition and, optionally, an isocyanate-reactive curative by applying onto a substrate the polyurethane adhesive composition and contacting the adhesive composition disposed on the substrate to a second substrate such that a bond is formed, the improvement which comprises utilizing a polyurethane prepolymer composition comprising the reaction product of (a) 4,4'-diphenyl-methane diisocyanate with a polyol composition comprising a polypropylene polyether polyol with functionality of two or greater and an average equivalent weight between 100 and 8000 and consisting essentially of at least 90 wt% perfect prepolymers, less than 2 wt% free MDI monomer and a free prepolymer NCO functionality ranging from 0.2 to 15 wt%.

32. (Previously presented) The method of Claim 31 in which the 4,4'-diphenyl-methane diisocyanate comprises an isomeric mixture of MDI containing 30 – 98 wt% of 4,4' isomer, 2 – 70 wt% of the 2,4' isomer, and 0 – 5 wt% of the 2,2' isomer (with the wt% totaling 100%); and/or polymethylen poly(phenylisocyanate) having an average isocyanate

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functionality of 2.1 to 3.5, isocyanate group content of 18.0 to about 33.6, and containing about 30 to 96 wt% monomeric 4,4' MDI, about 2–70 wt% monomeric 2,4' MDI, and less than 5 wt% monomeric 2,2' MDI, and from 2–60 wt% higher ring homologues of the MDI series (with the wt% totaling 100%).

33. (Previously presented) The method of Claim 31 in which the propylene oxide based polyether polyol is an ethylene oxide capped polypropylene polyether polyol.

34. (Currently amended) The method of Claim ~~44~~ 31 in which 0 to 60 wt% of the polyol composition comprises a di- or multi-functional alkylene ether polyol, a polyester polyol, a polyester polyol from polycarbonate or a hydroxyl terminated polybutadiene.

35. (Previously presented) The method of Claim 34 in which the polyurethane prepolymer composition consists essentially of less than 0.5 wt% free MDI monomer and contains a free prepolymer NCO functionality ranging from 0.5 to 8 wt%.

36. (Previously presented) The method of Claim 35 in which the polyol composition has an average Mn ranging from about 400 to 16,000.